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## Trends in health insurance and type among military veterans: United States, 2000–2016

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### Abstract

**Objectives—**To describe long-term national trends in health insurance among veterans in the U.S. from 2000 to 2016, in the context of recent health care reform.

**Methods—**Using data (2000–2016) on veterans aged 18 to 64 from the National Health Interview Survey, trends in insurance and uninsurance, by year, income and state Medicaid expansion status were examined. The current proportions (2016) with each type of insurance by age-group were also described.

**Results—**The percentage of veterans with private insurance decreased from 70.8% in 2000 to 56.9% in 2011, whereas between 2000 and 2016, VA health care (only) almost tripled, Medicaid (without concurrent TRICARE or private) doubled, and any TRICARE tripled. After 2011, the percentage uninsured decreased. In 2016, low-income veterans in Medicaid expansion states had double the coverage through Medicaid (41.1%), compared with low-income veterans in nonexpansion states (20.1%).

**Conclusions—**Estimates presented are nationally representative of noninstitutionalized veterans and show marked increases in military related coverage through TRICARE and VA health care. In 2016, 7.2% of veterans aged 18 to 64 (3.7% of veterans aged 18 and over) remain uninsured.

### Keywords

Veterans; Health insurance; Uninsured

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There are no potential conflicts of interest.

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NCHS Research Ethics Review Board approved NHIS data collection. Paper uses de-identified data, therefore not subject to federal regulations on protection of human research subjects 45 CFR46.101(b)(4)

## Introduction

The veteran population in the United States includes veterans with a variety of ages and active duty histories, including different combat, non-combat, and deployment experiences. The veteran population is also acknowledged to have a range of both unique and complex health care needs.<sup>1-3</sup> In order to meet the needs of veterans, both TRICARE health plans (managed by the Defense Health Agency under the leadership of the Assistant Secretary of Defense) and the Veterans Health Administration (VHA, operating under the Department of Veteran Affairs) have notably restructured and expanded in recent years.<sup>4-7</sup> These changes have been co-occurring with broader legislative changes such as the Affordable Care Act (ACA) of 2010. There is renewed interest in veterans' health care coverage and access to health care services in the context of national health care reform.<sup>8-12</sup> However, long-term national trends in health insurance among veterans are not well characterized, and it is not known whether they mirror published trends in the general population, given that many veterans have additional options for health care coverage (i.e., TRICARE and VA health care) outside of private insurance, Medicaid, Medicare and other government programs.

TRICARE health plans are available to veterans who are either: retired military, qualified Selected Reserve members (United States military Reserve members most readily available for active service) or Medal of Honor recipients (or the dependents of one of these three categories); or the dependents of active duty uniformed service members.<sup>13</sup> These health plans in many ways function like private insurance, and also meet the minimum essential coverage under ACA. TRICARE programs (based on prior CHAMPUS, or Civilian Health and Medical Program of the Uniformed Services) were enacted into law by Congress in 1994.<sup>5</sup> TRICARE introduced 'TRICARE for Life' benefits in 2001 (for those Medicare eligible) and 'TRICARE Reserve Select' in 2005 (for qualified Selected Reserve members and their families).<sup>5</sup>

The VHA is now the largest integrated health care system in the U.S.,<sup>14</sup> with approximately 8.7 million veterans enrolled, and 6.0 million who utilized the Veterans Affairs (VA) health care system in fiscal year 2016.<sup>15</sup> VA health care is not considered by VHA to be a health insurance plan,<sup>16</sup> and not all veterans are eligible for VA health care. Basic eligibility requires that veterans were separated from active military service under any condition other than dishonorable. Enrollment is also prioritized based on a number of factors such as income, disability status, and periods of service. However, once enrolled a veteran can have access for life, albeit with varying annual copayment requirements dependent largely on the prior year's income. Some veterans choose to use VA health care as their sole source of coverage (meeting the minimum essential coverage under the ACA); however, others use it in addition to other coverage. Recent legislative changes have impacted a veteran's eligibility to enroll in VA health care and ease of access, including: the National Defense Authorization Act of 2007, which extended automatic eligibility for enrollment in VA health care from 2 to 5 years post-deployment; and the Veterans Access, Choice and Accountability Act of 2014, which introduced new service options for veterans with long waits or living long distances from VA facilities.<sup>6,7</sup>

For veterans not eligible for a TRICARE health plan or VA health care, the other main options for coverage include private insurance, Medicaid, and Medicare. Examples of national health care reform affecting veterans include: ACA's extension of dependent coverage (since 2011) enabling young veterans (aged 18 to 26) to remain on their parents' insurance; opening of health insurance exchanges in 2013 for 2014 enrollment; the individual mandate requiring minimum essential coverage or payment of a penalty effective in 2014; subsidies (on a sliding scale) for buying health insurance in 2014; and expanded access to Medicaid for veterans with low- and moderate-incomes in states that chose to expand Medicaid under provisions of the ACA starting in 2014.

There is a lack of nationally representative data, particularly trend data, on the proportions of veterans covered by the various different types of health insurance.<sup>17,18</sup> Using data from the National Health Interview Survey (NHIS), this study aims to report long-term national trends in various types of health insurance among veterans aged 18–64 in the U.S. from 2000 to 2016. Trends in uninsurance by age group and recent changes (between 2010 and 2016) in insurance type by income and state Medicaid expansion status are also examined. The current proportions of all veterans (aged 18 and over in 2016) with each type of insurance by age group are also described.

Given that veterans have unique health needs and two potential additional sources of coverage (i.e., TRICARE and VA health care) not open to the majority of civilians, and that there has been military/veteran tailored health care legislation and reform, it is unknown whether trends in insurance among veterans from 2000 to 2016 will mirror or differ from those routinely published for the general U.S. population.

## Methods

We used data on U.S. veterans from the NHIS. The NHIS is a multi-stage, nationally representative household survey of the civilian noninstitutionalized population of the U.S., conducted continuously throughout the year by the National Center for Health Statistics (NCHS). It is an in-person interview conducted in the respondent's home, with occasional telephone follow-up. This study uses the Family Core component of the survey, which includes information on veteran status and detailed health care coverage for all family members.

In total, 107,687 veterans were surveyed from 2000 to 2016. Veterans were defined as adults (aged 18 and over) not currently on full-time active duty with the U.S. Armed Forces who had ever been honorably discharged from active duty in the Armed Forces (questionnaires 2000–2010) or had ever served on active duty in the Armed Forces, military Reserves, or National Guard (questionnaires 2011–2016). Note that this change in measurement of veteran status in the NHIS means that there are some veterans in the sample from 2011 onwards that are not eligible for VA health care based on dishonorable discharge. The NHIS does not sample homeless persons or those in institutional settings, so veterans from these living situations are not included in the data. Our analytical sample was generally restricted to veterans aged 18 to 64 years (sample size of 62,192 veterans) except for Table 1 (Insurance types by age group in 2016).

For all analyses, a hierarchical variable indicating ‘type of health insurance’ was created as the primary dependent variable, using the following ordered categories: any TRICARE; private; Medicaid; other health insurance sources; VA health care only; and uninsured. These categories are mutually exclusive and veterans with multiple coverage types were categorized into the first applicable category. For example, a veteran with both TRICARE and private insurance was categorized into the TRICARE category. TRICARE coverage includes any TRICARE plan. Private coverage includes comprehensive private insurance plans, including those obtained through an employer, purchased directly, purchased through local or community programs, or purchased through the Health Insurance Marketplace or state-based exchanges. Medicaid coverage includes Medicaid and state-sponsored plans. Other sources include Medicare, Civilian Health and Medical Program of the Department of Veterans Affairs (CHAMPVA), Children’s Health Insurance Program (CHIP), and other government. The VA health care only category captures those respondents who report VA health care but no other coverage type. Uninsured persons are those without any TRICARE, private, Medicaid, VA health care, or other coverage or who have only Indian Health Service coverage or single-service plans (e.g., vision, dental).

To account for changes in the age distribution of the veteran population from 2000 to 2016, estimates of long-term trends in Figure 1 (and appendix 1 and 4) are age-adjusted using the projected 2000 U.S. population as the standard population and using five age groups: 18–25; 26–34; 35–44; 45–54; 55–64.<sup>19</sup>

All percentages and standard errors were calculated using SUDAAN to account for complex survey design and used survey sample weights of the NHIS to produce estimates that are nationally representative of the noninstitutionalized population of veterans residing in the US.<sup>20</sup> The statistical significance of trends in health care coverage was assessed by using Joinpoint software.<sup>21</sup> Joinpoint regression uses statistical criteria to determine the smallest number of joined linear segments necessary to characterize a trend, the year when a segment begins and ends, and the annual percent change, for each segment of trend. A 95% confidence interval around the annual percent change is used to determine whether the annual percent change for each segment is significantly different from zero (thereby assessing whether the trend is increasing, decreasing or constant). Weighted least squares regression was used, with the weights defined as the square of the response variable divided by the square of the standard error.

## Results

In 2016, there were approximately 21 million veterans in the U.S, of which 50.0% were aged 18 to 64. Among veterans aged 18 to 64, approximately 13.8% had any TRICARE, 58.7% had private insurance (and not TRICARE), 6.4% had Medicaid coverage (and not TRICARE or private), 3.9% had coverage just from other sources, 10.1% had VA health care only, and 7.2% were uninsured (Table 1). Among veterans aged 65 and over, other coverage (predominately Medicare) was more common (38.0%) and uninsurance was very rare (less than 0.5%). Young veterans aged 18 to 25 or 26 to 34 were the most likely age groups to be covered by VA health care only (16.3% or 15.7% respectively) or to be uninsured (9.5% and 13.7% respectively).

Among veterans aged 18–64, there was a decrease in the age-adjusted percentage of veterans with private insurance between 2000 and 2011, from 70.8% to 56.9% ( $p<0.001$ ), with no significant change in the age-adjusted percentage with private insurance from 2012 to 2016 (Figure 1, and see appendix 1 for corresponding data table with crude percentages included). Conversely the age-adjusted percentage of veterans aged 18–64 with any TRICARE steadily increased from 2000 to 2016 (5.0% to 14.5%,  $p<0.001$ ), as did the percentage with VA health care only (4.0% to 11.3%,  $p<0.001$ ). Medicaid coverage slowly increased between 2000 and 2012 with an annual percentage change (APC) of 2.5% (3.3% to 3.6%,  $p=0.03$ ). Medicaid coverage then had an escalated increase (APC of 21.5%) from 2013 to 2016 (3.9% to 6.7%,  $p<0.05$ ). The age-adjusted percentage of those with other coverage rose between 2000 and 2016 (1.1% to 2.3%,  $p<0.001$ ). The age-adjusted percentage of veterans who were uninsured did not significantly change from 2000 until 2010, when it then dropped by nearly a half, from 16.7% in 2011 to 8.6% in 2016 ( $p<0.001$ ).

Uninsurance trends between 2000 and 2016 differed by age (Figure 2, see appendix 2 for data table). Among the youngest veterans (aged 18–25), the crude percentage uninsured fluctuated (but did not significantly change) from 2000 to 2008, although it decreased after that from 33.5% in 2009 to 9.4% in 2016 ( $p<0.01$ ). There was no significant change in uninsurance among veterans aged 26–34 from 2000 to 2016. Among veterans aged 35–44, uninsurance decreased overall from 2000 to 2016 (15.7% to 8.2%,  $p<0.01$ ). Uninsurance increased among veterans aged 45–54, from 2000 to 2004 (7.9% to 10.1%,  $p=0.01$ ), then stabilized until 2011, after which uninsurance decreased (from 12.5% in 2012 to 6.0% in 2016,  $p<0.01$ ). Veterans aged 55–64 have not experienced a significant change in the percentage uninsured in the past 17 years.

The ACA's expansion of Medicaid eligibility was not uniformly implemented across states. We examined changes in coverage between 2010 and 2016 among veterans aged 18 to 64, by income and state Medicaid expansion status. TRICARE coverage increased among moderate-income veterans in Medicaid expansion (6.9% to 11.5% ( $p=0.03$ ) and nonexpansion states (9.4% to 15.3%,  $p=0.02$ ) (Table 2, see appendix 3 for corresponding figure). Among low- and moderate-income veterans, there was no significant change in the crude percentage with private insurance between 2010 and 2016, regardless of whether they lived in a Medicaid expansion state. Medicaid coverage significantly increased among low-income veterans in both Medicaid expansion (23.8% to 41.1%) and nonexpansion states (8.9% to 20.1%); however, the magnitude of the change was higher in Medicaid expansion states compared to nonexpansion states (58.0% increase compared to 44.4% increase). There was no change in the percentage of veterans with other or VA only coverage in any category between 2010 and 2016.

Overall, in states that expanded Medicaid, among both low- and moderate-income veterans, uninsurance dropped significantly, from 29.2% to 12.5% ( $p<0.001$ ) and from 15.3% to 7.8% ( $p<0.001$ ) respectively (Table 2, see appendix 3 for corresponding figure). However, in nonexpansion states, the drop in uninsurance observed among low- or moderate-income veterans was smaller and not statistically significant. Uninsurance was highest among low-income veterans from nonexpansion states in both 2010 and 2016 (33.0% and 22.7% respectively).

## Discussion

From 2000 to 2016, veterans' health care coverage was increasingly composed of TRICARE, Medicaid, or VA health care (only), and a decreasing proportion of veterans were covered by private insurance. From 2011 onwards, uninsurance among veterans aged 18 to 64 declined, and in 2012, the percentage with private coverage stopped decreasing.

As published by Cohen et al. (2017), the decrease in private coverage was also seen in the general population prior to 2013, albeit at a slower rate (with an approximate 0.8% decrease per year among the general population and 2.0% decrease per year in veteran population aged 18 to 64).<sup>22</sup> It should be noted that in our analyses, veterans who jointly had private insurance and TRICARE coverage (1.8% of veterans aged 18–64 years, data not shown) were grouped into the TRICARE coverage category. Therefore, we did additional analyses of veterans with 'any private insurance' (see appendix 4) to make sure that the trends in private insurance among veterans in this analysis were being fairly compared to trends in the general population, which did not account for people with TRICARE coverage. The data in appendix 4 show the same trends in any private insurance among veterans aged 18 to 64 that were observed in figure 1 (private no TRICARE): There was a significant decrease in the age-adjusted percentage of veterans with any private insurance from 2000 to 2011 ( $p < 0.001$ ), with no significant change in the age-adjusted percentage with any private insurance from 2012 to 2016 (see appendix 4).

From 1997 to 2007, Cohen et al. (2009) also reported a 5.4% increase per year in Medicaid among U.S. adults aged 18 to 64. A much slower increase in Medicaid was observed in the veteran population (aged 18 to 64) from 2000 to 2012 (2.5% increase per year).<sup>23</sup> Although the NHIS data are cross sectional, and therefore casual inferences cannot be made, this slower increase in Medicaid may be explained by the accompanying increases in TRICARE and VA only observed in the veteran population over the same time period.

The increasing trend in the proportion of veterans aged 18 to 64 who are covered by TRICARE could be due to the newly available TRICARE Reserve Select plan (since 2005), which covers National Guard or Reserves (in deactivated status). After September 11, 2001, there was a surge in the number of National Guard becoming activated (more than 50,000 by December 2001).<sup>24</sup> Once these troops were deactivated they were considered veterans, and after 2005 some were eligible for TRICARE Reserve Select.<sup>13</sup> The TRICARE increases could also reflect underlying temporal changes to the veteran population since the end of the draft in the 1970s, with an increasing percentage of the veteran population consisting of professional soldiers who retired from the military (rather than being discharged) and who are therefore eligible for five of the existing TRICARE health plans.<sup>25</sup>

Of the 8.7 million enrollees in VA health care and 6.0 million veterans who utilized the VA in 2016,<sup>15</sup> estimates derived from the NHIS data suggest that 1.2 million (an estimated 14.0% of veterans enrolled in and 20.0% of veterans utilizing VA health care in 2016) relied on VA health care alone for their health coverage. The increasing trend in the number of veterans citing the VA as their only source of coverage (4.0% in 2000 to 11.3% in 2016) is consistent with increasing enrollment and utilization of VA health care reported by the VA.<sup>26</sup>



Historically veterans were much less likely to be uninsured than nonveterans.<sup>27</sup> This study found that in 2000, 11.3% (crude, see appendix 1) of veterans aged 18 to 64 were uninsured compared with the published statistic of 16.8% in the general population.<sup>23</sup> The proportion uninsured started to decrease among veterans from 2011, and two years later (2013) a decrease in uninsurance was observed in the general population.<sup>22</sup> The overall increasing trends in TRICARE and VA only among veterans may explain why the decrease in uninsurance was observed earlier among veterans compared with the general population. By 2016 the magnitude of the difference in uninsurance statistics (5.2 percentage points) between veterans aged 18 to 64 (7.2%) and the general population aged 18 to 64 (12.4%) was still similar to the aforementioned difference in 2000 (5.5 percentage points).<sup>22</sup>

Veterans in the younger age groups had the highest levels of uninsurance. Among the youngest veterans (aged 18 to 25) uninsurance began to significantly and continuously decrease after 2009. This decrease roughly coincided with two changes to legislation: the National Defense Authorization Act of 2007, which extended automatic eligibility for enrollment in VA health care from 2 to 5 years post-deployment, and the extension of dependent coverage (since 2010) allowing young adults (18–25 years) to remain insured through their parents for the first time under ACA. By 2016, uninsurance among these youngest veterans had decreased by 24.1 percentage points (2009 to 2016). It should be noted, however, that the proportion of veterans aged 26 to 34 who were uninsured has not significantly changed since 2000, and uninsurance actually increased among veterans aged 45 to 54 (until 2005). In 2012, the percent uninsured started decreasing among veterans aged 45 to 54, one year earlier than decreases in uninsurance among the general population.

In 2010, states that later chose to expand Medicaid coverage had a higher proportion of low- and moderate-income veterans aged 18 to 64 covered by Medicaid (even after stratifying by income group) than states that did not expand Medicaid. Even though low-income veterans had increased coverage through Medicaid by 2016 regardless of expansion status, the magnitude of the increase was higher in expansion states. Low-income veterans in expansion states had the highest Medicaid coverage of all groups (41.1%) in 2016, double the proportion covered by Medicaid among low-income veterans in nonexpansion states (22.7%) in 2016. TRICARE coverage increased among moderate-income veterans regardless of expansion status of state of residence, likely reflecting overall trends in the veteran population. However, the lack of significant change in uninsurance among low- and moderate-income veterans in nonexpansion states (despite overall decreases in uninsurance among veterans after 2011) needs further investigation.

The observed trends between 2000 and 2016 may have been influenced by the previously mentioned change in NHIS' measurement of veteran status (and therefore the denominator) from 2011 onwards. From 2011 onwards, veterans who were dishonorably discharged (and therefore not eligible for VA health care) were nevertheless included in the denominator, and there was a concurrent wording change clarifying but not changing the inclusion of veterans who were prior active duty with the Reserves or National Guard (and therefore potentially eligible for VA health care). However, the change in measurement of this denominator in 2011 did not significantly change the estimated population size. As calculated using NHIS data, there was no significant change in the estimated veteran population size from 2008 to

2016 (remaining at approximately 21 million, data not shown). Therefore, it is unlikely that the change in measurement influenced the direction or overall significance of the observed trends in health insurance.

The focus of this paper was a descriptive analysis of trends over time and not a pre/post policy analysis of the ACA. Although we were able to compare insurance coverage in the veteran population between 2010 and 2016, by state Medicaid expansion status, it was not within the scope of this paper to assess and control for state-level legislation and other state-level factors (other than stratifying by income). Moreover, this descriptive analysis of trends does not lend itself to an examination of other aspects of health reform such as guaranteed coverage for pre-existing conditions.

The NHIS data have many strengths. The NHIS has been collecting health insurance data periodically since 1959 and annually since 1989, allowing for long-term trend analyses. NHIS estimates of health insurance and coverage are more suited for the present analysis than other survey-based estimates (such as the Current Population Survey) because the NHIS differentiates between sources of military-related health insurance (instead of combining them as one category). The NHIS also makes use of responses to follow-up questions (including questions about specific plan names) to evaluate the reliability of the reported health insurance coverage and adjudicate conflicting information where necessary. This detailed measurement has allowed for the creation of the hierarchical variable categorizing important health insurance types among veterans while accounting for the fact that people (and veterans especially) can have multiple sources of coverage. This categorization of health insurance coverage among veterans, and subsequent data analyses, complement the statistics published using administrative data from the VA on enrollment and utilization in VA health care. Given that administrative data on outside sources of coverage (such as private insurance) are incomplete,<sup>17,18</sup> the NHIS data have added to the knowledge of where veterans have obtained health coverage beyond the VA.

In conclusion, the increasing trends in Medicaid coverage (possibility accelerated by Medicaid expansion) and decreasing trends in private insurance coverage among veterans aged 18 to 64, mirror the trends seen in the general population from 2000 to 2016. However, veteran-specific gains in coverage have been observed, including an earlier decrease in uninsurance rates (particularly among young veterans) and marked increases in coverage through TRICARE health plans and VA health care. Uninsurance is now at an all-time low with 7.2% of veterans aged 18 to 64 uninsured, and 3.7% of all veterans (aged 18 and over) uninsured.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

## Acknowledgments

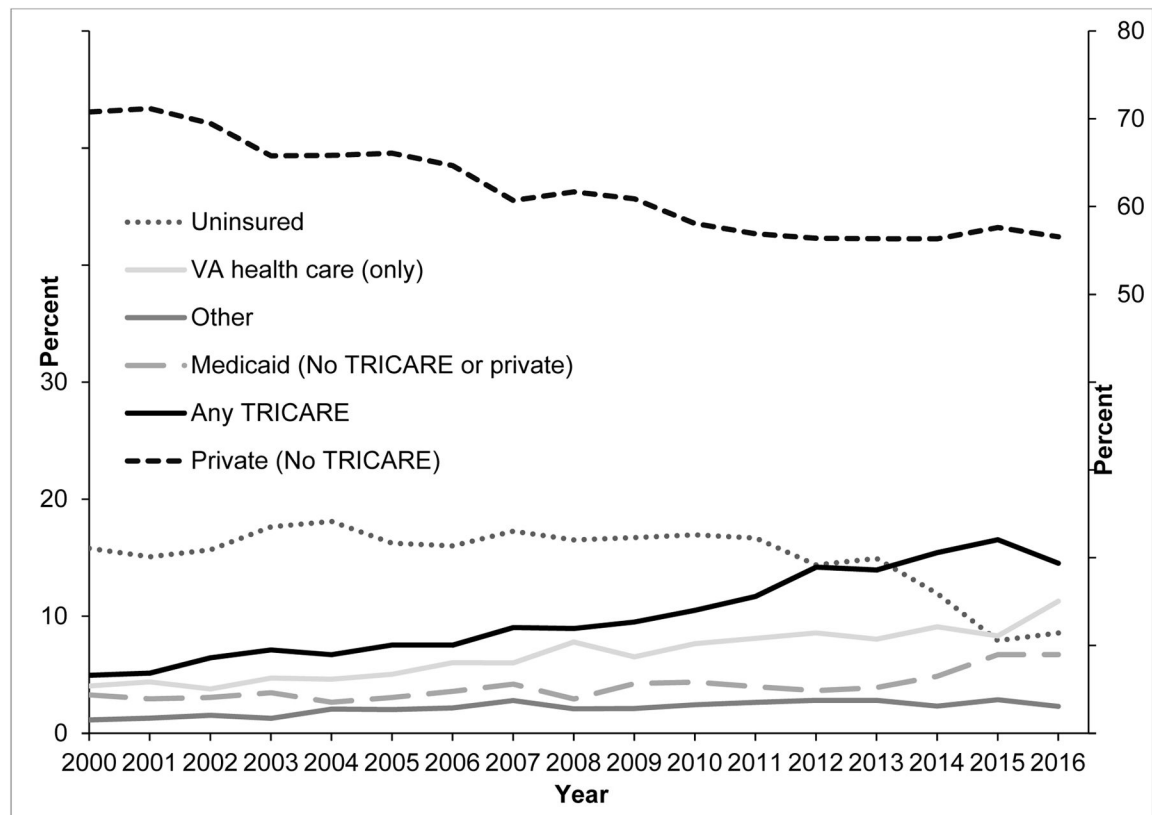
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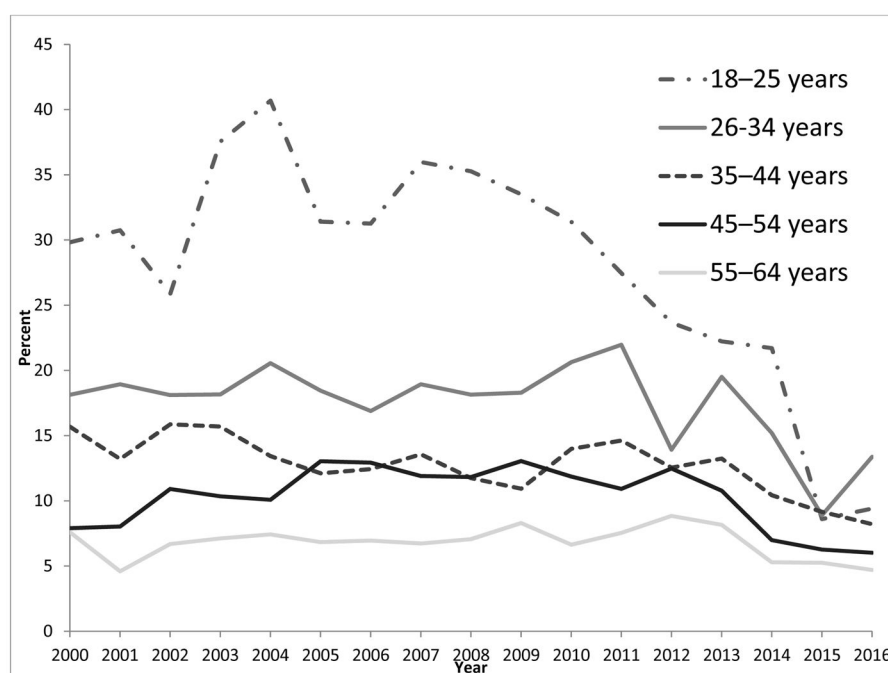
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**Figure 1. Age-adjusted percentages of military veterans (aged 18 to 64) with each type of health insurance and without health insurance, by year: United States, 2000–2016**

**Source:** Authors' analysis of 2000–2016 data from the NCHS, National Health Interview Survey.

**Notes:** Health insurance is at the time of the interview. The figure reflects point estimates for the indicated year. Estimates are age-adjusted using the projected 2000 U.S. population as the standard population and using six age groups: 18–25; 26–34; 35–44; 45–54; and 55–64.



**Figure 2. Crude percentage of military veterans (aged 18 to 64) who lacked health care coverage (uninsured), by age group and year: United States, 2000–2016**

**Source:** Authors' analysis of 2000–2016 data from the NCHS, National Health Interview Survey.

**Notes:** Uninsurance is at the time of the interview. The figure reflects point estimates for the indicated year.

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**Table 2**

Crude percentage of military veterans (aged 18 to 64 years) with each type of health insurance and without health insurance, by family income, Medicaid expansion status and year: United States, 2010 and 2016

	Medicaid Expansion States						Non-Medicaid Expansion States					
	Low income (<= 138% FPL)			Moderate income (139–400% FPL)			Low income (<= 138% FPL)			Moderate income (139–400% FPL)		
	2010	2016	SE	2010	2016	SE	2010	2016	SE	2010	2016	SE
<b>Uninsured</b>	29.2	12.5	(3.4)	15.3	12.5	(1.5)	33.0	22.7	(3.7)	14.0	10.4	(1.5)
<b>VA health care (only)</b>	14.8	15.4	(2.8)	12.8	15.4	(1.5)	23.2	20.2	(3.6)	14.1	14.9	(2.0)
<b>Other</b>	*6.8	9.6	(2.2)	6.3	9.6	(1.0)	7.8	8.2	(2.1)	5.6	5.8	(1.1)
<b>Medicaid (No TRICARE or Private)</b>	23.8	41.1	(3.4)	3.5	41.1	(0.8)	8.9	20.1	(2.1)	*1.8	3.7	(1.0)
<b>Private (No Tricare)</b>	23.2	15.7	(3.4)	55.2	15.7	(2.3)	20.6	17.0	(3.2)	55.2	49.9	(2.4)
<b>Any TRICARE</b>	*2.3	*5.8	(1.0)	6.9	*5.8	(1.3)	*6.4	11.8	(2.0)	9.4	15.3	(2.1)

**Source:** Authors' analysis of 2010 and 2016 data from the NCHS, National Health Interview Survey.

**Notes:** Health insurance is at the time of the interview. Income refers to family income, which is the income of an individual or group of two or more related people living together in the same housing unit. Low income is up to 138% of the federal poverty level, and moderate is 139–400% of federal poverty level. Medicaid expansion states include states that had adopted Medicaid expansion for a majority of 2016 or earlier (AK, AZ, AR, CA, CO, CT, DE, DC, HI, IL, IN, IA, KY, MD, MA, MI, MN, MT, NV, NH, NJ, NM, NY, ND, OH, OR, PA, RI, VT, WA, WV). Data preceded by an asterisk (\*) have a relative standard error (RSE) greater than 30% and less than or equal to 50% and should be used with caution.